

2004 Fiscal Year Summary Foodborne Illness Surveillance

**Michigan Department of Agriculture
Food and Dairy Division**

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Information presented in this summary is derived from the Michigan Department of Agriculture Foodborne Illness Surveillance Database, with data originating from reports sent by local health agencies and received as of March 1, 2005.

Summary

The Michigan Department of Agriculture (MDA) maintains a database of reported events that meet the Michigan definition¹ of a foodborne illness outbreak. This summary of reported events that occurred during the 2004 fiscal year is intended to help state and local food safety officials to better understand, monitor and prevent the causes of foodborne illness in Michigan.

¹ **Foodborne Illness Outbreak-** Incidents involving two or more unrelated cases having similar features or involving the same pathogen; single incidents of certain rare foodborne pathogens. (based on definition in Michigan Food Law, P.A. 92 of 2000, Section 3103)

Results and Discussion:

During the fiscal year, a total of **192** alleged foodborne illness outbreaks, involving **1470** illnesses, were reported to MDA.

- Local health agencies, the Michigan Department of Agriculture, the Michigan Department of Community Health and, on occasion, federal agencies, collaboratively investigated these reports and complaints.
- Gastrointestinal infections are not limited to foodborne transmission; they can be transmitted by person-to-person contact, contact with infected animals, contact with contaminated surfaces and through contaminated water. In smaller incidents, non-foodborne transmission often cannot be discounted.
- In Figure 4, the month of July 2004 shows a significant increase in illnesses, due to two large norovirus outbreaks that caused at least 196 illnesses. Peaks in numbers of illnesses also occur during November 2003, and February and March 2004, again, primarily due to norovirus outbreaks. Although norovirus outbreaks occur during any time of the year, they occur more often during the colder months.
- The leading causative agents identified for reported foodborne illness outbreaks were:

<u>Agent:</u>	<u># Ill:</u>	<u># of Events:</u>
Norovirus	471	12
<i>Salmonella spp.</i>	16	3

The causative agent was identified in only 9.4% of reported foodborne illness outbreaks. Identifying the causative agents of foodborne illness outbreaks is important because appropriate control strategies differ for various agents. For example, while ill humans are the reservoirs of norovirus, both humans and raw foods of animal origin can carry *Salmonella*.

- A relatively few outbreaks accounted for a majority of the illnesses. Thirty-one outbreaks involving 10 or more person (16% of all reported outbreaks) accounted for 890 of illnesses (61% of all reported outbreak illnesses).
- The median size of reported outbreaks was 4 persons.
- The Centers for Disease Control and Prevention have identified five behaviors and practices as being key contributing factors of foodborne illness:
 - Poor personal hygiene;
 - Food from unsafe sources;
 - Inadequate cooking;
 - Improper holding temperatures, and
 - Contaminated equipment.

Michigan data helps support this CDC finding. The most frequently cited causes of reported foodborne illness outbreaks noted on CDC 52.13 forms were bare-hand contact by food handler/worker/preparer, handling of food by an infected person or carrier of pathogen and inadequate cleaning of equipment and utensils (Figure 5).

- It is widely recognized that the number of reported foodborne illnesses represents a small fraction of the total cases that occur. Due to this underreporting and other factors, the number of foodborne illnesses reported cannot be interpreted as an indicator of the relative safety of foods in any jurisdiction. For example, seven agencies (Oakland, Kent, Detroit, Wayne, Genesee, Macomb and Washtenaw) reported approximately 68% of foodborne illness outbreaks. These are large population centers and likely reflect concomitant investigation and surveillance efforts.

Highlights of Outbreak Investigations:

1. During 2004, norovirus was the leading reported cause of laboratory confirmed foodborne illness outbreaks. Of 17 laboratory confirmed outbreaks, 12 were due to norovirus. Many of these outbreaks were large. Norovirus outbreaks are typically transmitted via food after an infected foodhandler handles food in an unsanitary manner. Such was the case when an ill food handler inadvertently contaminated food served at catered luncheons at 3 different local clinics in February, causing approximately 55 illnesses. Investigators made several recommendations to the restaurant management, highlighting the importance of proper exclusion/restriction of ill food service workers and the importance of good hygienic practices.
2. Two outbreaks were attributed to the consumption of unpasteurized (or raw) milk. In both outbreaks, investigators provided education to those responsible about the hazards of consuming unpasteurized milk, and encouraged them to serve only pasteurized milk. In October 2003, six members of a church youth group became ill after consuming raw milk contaminated with *Campylobacter jejuni*. The raw milk was provided to the children by a parent, as part of a snack. In March 2004, six individuals residing or working at a dairy farm

became ill after consuming raw milk contaminated with multi-drug resistant *Salmonella newport*. This particular strain of *Salmonella newport* matched strains in three 2001 outbreaks associated with raw milk consumption.

3. In September 2004, fifty-five students, teachers and parents became ill after consuming spaghetti contaminated with *Clostridium perfringens* at a catered meal served at a high school. Cooked foods can become contaminated with *Clostridium perfringens* when they are cooled inadequately or held at temperatures that are not hot enough. Investigators made recommendations to the caterer and other school officials involved, emphasizing the importance of monitoring food temperatures, and of heating and cooling food more rapidly by dividing larger batches of food products into smaller dishes or containers.

Reporting:

- MDA uses foodborne illness data to investigate emerging threats, to illustrate trends, and to ensure accurate reports are reflected at the state and national level.
- Since 2003, foodborne illness reporting became more streamlined to eliminate unnecessary paperwork for local and state agencies. Local health agencies no longer needed to submit single alert and family complaints to MDA. See the following correspondence for details of streamlining efforts:
http://www.michigan.gov/documents/MDA_FSPR_FBItr2LHDs+attachments_69152_7.pdf
- In certain cases, Termination Reports are accepted as substitutes for final written reports. Termination Report forms are used in the following situations:
 - When events are determined not to be foodborne illness outbreaks after investigation
 - For incidents where complainants refuse to provide sufficient information to conduct a proper investigation
 - For incidents reported to agencies so late that an adequate investigation cannot be completed

When a Termination Report is completed, reasons for its use must be indicated on that form.

- In fiscal year 2004, final reports or termination reports were received for 90% of reported foodborne illness outbreaks.
- Accreditation findings show that 80% of local health agencies were found to respond to a foodborne illness complaint within 24 hours of notification (Minimum Program Requirement 6.1), but only 30% met foodborne illness investigation procedure requirements relating to documentation and reporting of foodborne illness outbreaks (Minimum Program Requirement 6.2).

Foodborne Illness Response Strategy Training (F.I.R.ST.)

In fiscal year 2004, staff from MDCH, MDA and local health collaborated to provide two-day training sessions on successful foodborne illness outbreak investigations, with an emphasis on teamwork. Two 2-day training sessions were held for sanitarians, nurses, epidemiologists and others involved in foodborne illness outbreak investigations. Seventy-two people from 6 different local health agencies and MDCH were trained.

Foodborne Illness Risk Factor Reduction

In 2004, Governor Granholm's "Foodborne Illness Risk Factor Reduction" initiative established a goal to reduce the prevalence of the identified high-risk behaviors in food service and retail food establishments by 25%, by 2010. A baseline survey will be completed by September 2005. MDA and partners will then establish a 5% reduction **performance measure** for each of the next five years, through September 2010. This goal is consistent with a national goal established by the Food and Drug Administration.

Several strategies are being used to control high-risk behaviors and prevent foodborne illness in Michigan's licensed food establishments:

- New food service establishment operators are now required to submit written Standard Operating Procedures, that detail management's procedures for safe food handling, prior to opening for business.
- Local health department sanitarians have been trained to conduct "risk-based inspections", that focus on identifying high-risk behaviors, by in-house trainers that have been standardized by MDA.
- The quality of local health department inspection programs is assessed through the Michigan Local Public Health Accreditation Program by MDA. Special recognition is given to those departments who contribute to the state's goal to reduce the occurrence of high-risk behaviors. Corrective Plans of Action are required to be prepared when deficiencies are noted. MDA conducts a follow-up evaluation to determine if the plans have been successful. A local health department may lose accreditation status for failure to meet minimum program requirements.
- Emphasis is being placed on long-term compliance. Food establishment management is asked to prepare written Risk Control Plans that detail procedures for controlling the risk factors in existing operating non-complying establishments.
- Greater focus is being placed upon the training and knowledge of food managers and employees.

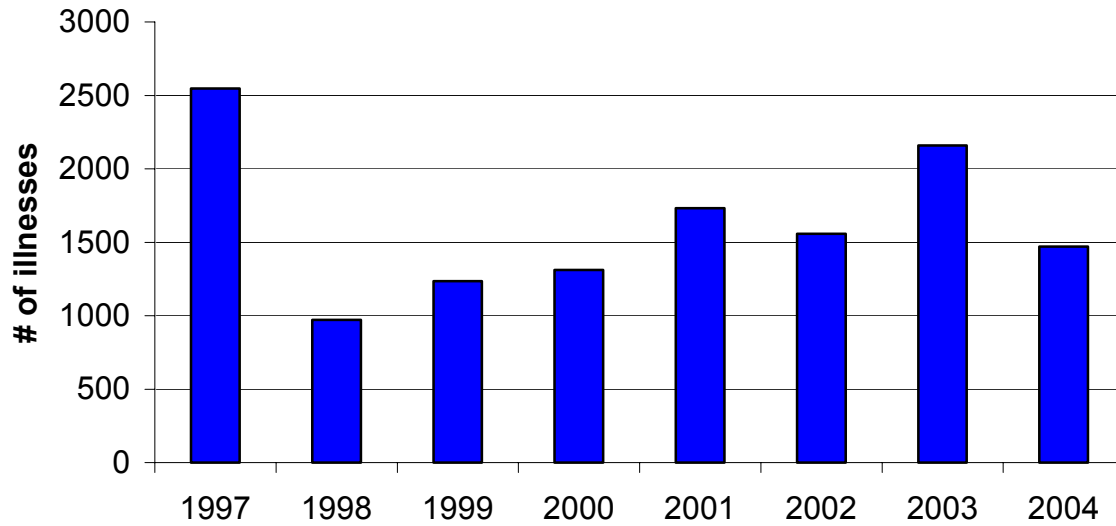
MDA has enrolled in FDA's National Regulatory Program Standards designed to address active managerial control of foodborne illness risk factors. The food inspection program is being strengthened to meet these standards in areas such as compliance & enforcement, foodborne illness investigation, regulatory staff training, and program assessment.

Recommendations

State and local food safety agencies should:

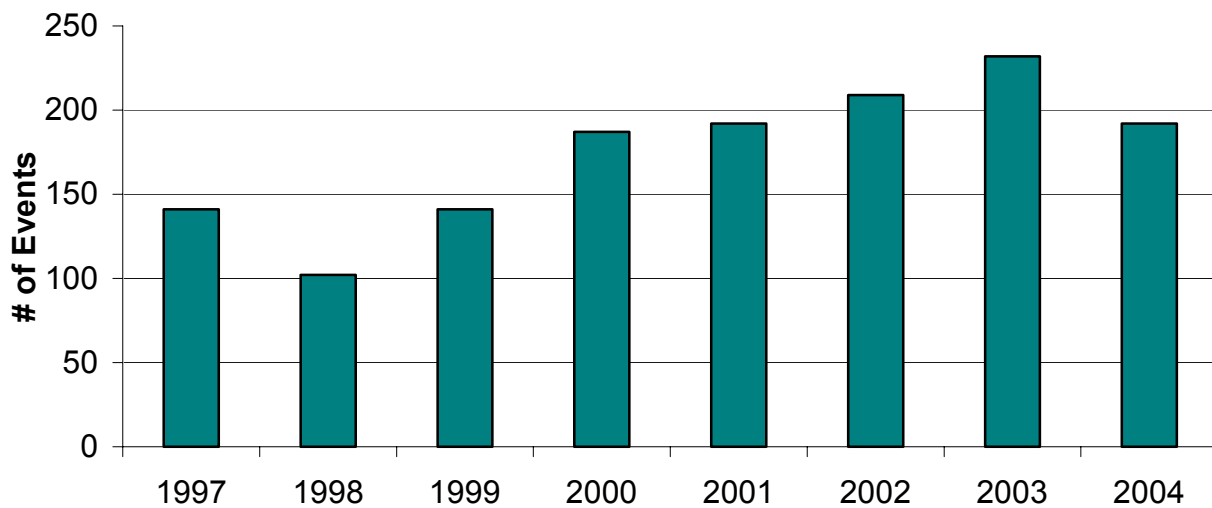
1. Ensure that staff investigating foodborne illness outbreaks:
 - a) are adequately trained before being assigned these tasks, and
 - b) maintain their skill through periodic participation in training programs focusing on outbreak investigation techniques.
2. Continue emphasis on minimizing bare-hand contact with ready-to-eat foods.
3. Continue emphasis on exclusion and/or restriction of ill food handlers.
4. Evaluate hot-holding practices, to ensure proper time and temperature standards for foods (meets requirements in Section 3-401.13, 3-403.11 and 3-501.16 of the 1999 Food Code).
5. Evaluate the potential for cross-contamination within each facility during both environmental assessments and routine inspections.
6. Evaluate cooling practices to ensure rapid cooling of potentially hazardous foods (meets requirements in Sections 3-501.14 & 15 of the 1999 Food Code).
7. Identify higher percentages of etiologic agents causing foodborne illness outbreaks, through appropriate laboratory testing.

Figure 1: Summary of Foodborne Illness Outbreaks, by Number of Illnesses, 1997 - 2004*



*Statistics from 2002 -2004 are based on the MDA fiscal year rather than on calendar year

Figure 2: Summary of Foodborne Illness Outbreaks, by Number of Events, 1997 - 2004*

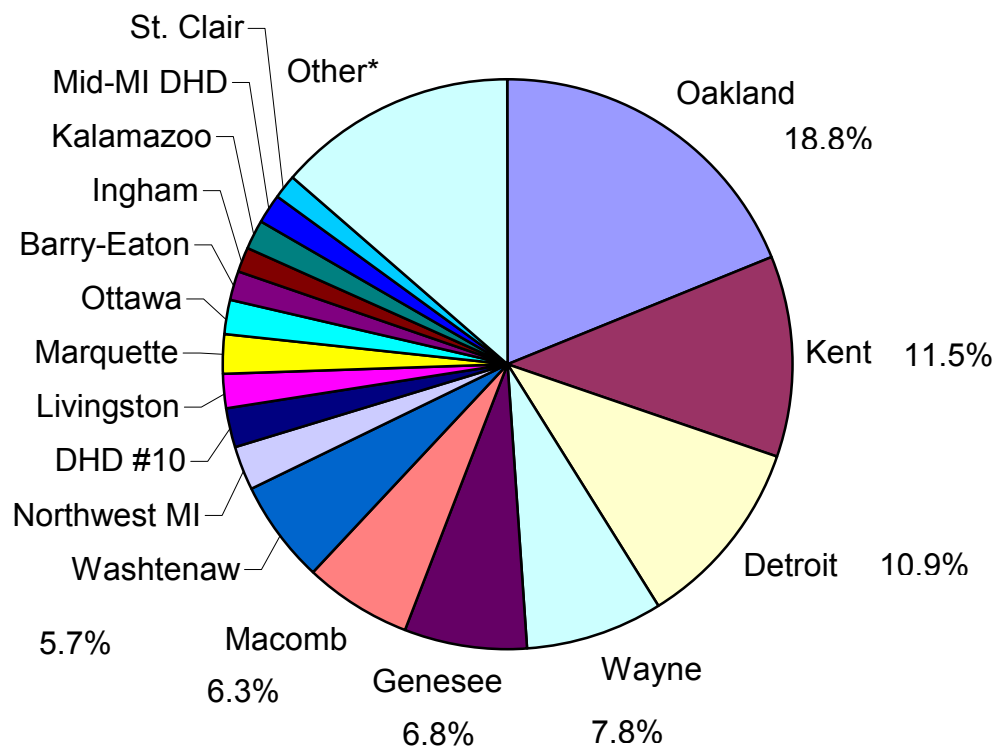


*Statistics from 2002 -2004 are based on the MDA fiscal year rather than on calendar year

Foodborne Illness Outbreaks by Local Health Department							
		% of	% of		% of Total	Reports	Missing
Jurisdiction	FBI Outbreaks	Total FBIs	Total MI FSEs	Population	Population	Filed w/ State	Reports
Oakland	36	18.9%	12.1%	1,207,869	12.0%	36	0
Kent	22	11.6%	5.7%	590,417	5.9%	22	0
Detroit	21	11.1%	6.2%	951,270	9.4%	9	12
Wayne	15	7.9%	10.9%	1,077,508	10.7%	14	1
Genesee	13	6.8%	4.3%	442,250	4.4%	10	3
Macomb	12	6.3%	7.3%	813,948	8.1%	12	0
Washtenaw	11	5.8%	3.4%	338,562	3.4%	11	0
Northwest MI	5	2.6%	1.9%	107,815	1.1%	5	0
DHD #10	4	2.1%	3.0%	263,295	2.6%	4	0
Livingston	4	2.1%	1.1%	172,881	1.7%	4	0
Marquette	4	2.1%	0.8%	64,616	0.6%	4	0
Ottawa	4	2.1%	1.1%	221,545	2.2%	4	0
Barry-Eaton	3	1.6%	1.6%	164,971	1.6%	3	0
Ingham	3	1.6%	3.0%	282,030	2.8%	3	0
Kalamazoo	3	1.6%	2.4%	242,110	2.4%	3	0
Mid-MI DHD	3	1.6%	1.6%	173,036	1.7%	3	0
St. Clair	3	1.6%	1.5%	169,063	1.7%	2	1
Bay	2	1.1%	1.3%	109,452	1.1%	2	0
Calhoun	2	1.1%	21.4%	138,854	1.4%	2	0
DHD #2	2	1.1%	1.0%	69,670	0.7%	2	0
Midland	2	1.1%	1.9%	84,492	0.8%	2	0
Monroe	2	1.1%	1.4%	150,673	1.5%	2	0
Muskegon	2	1.1%	1.8%	173,090	1.7%	2	0
Saginaw	2	1.1%	2.3%	209,327	2.1%	2	0
Benzie-Leelanau	1	0.5%	0.5%	38,938	0.4%	1	0
Berrien	1	0.5%	2.0%	162,766	1.6%	1	0
Br-Hills-St.Joe	1	0.5%	0.7%	156,508	1.6%	1	0
Central MI	1	0.5%	2.1%	190,239	1.9%	1	0
Chippewa	1	0.5%	0.6%	38,822	0.4%	1	0
Delta-Menomine	1	0.5%	0.8%	63,401	0.6%	1	0
Holland	1	0.5%	0.8%	35,048	0.3%	1	0
Ionia	1	0.5%	0.5%	63,573	0.6%	1	0
LMAS	1	0.5%	0.9%	36,928	0.4%	1	0
Sanilac	1	0.5%	0.5%	44,583	0.4%	1	0
Tuscola	1	0.5%	0.5%	58,382	0.6%	1	0
Van Buren/Cass	1	0.5%	0.8%	129,595	1.3%	1	0
	192	100.0%				175	17
		Estimated Michigan Population = 10,079,985 (2003 est.)					
		Michigan Foodservice Establishments = 31,675 (approx as of 1/20/05)					
NOTE: The number of reported illnesses cannot be interpreted as indicating the relative risk or safety of food in any jurisdiction.							

**Figure 3: Foodborne Illness Outbreaks
by Local Health Agency**

N= 192



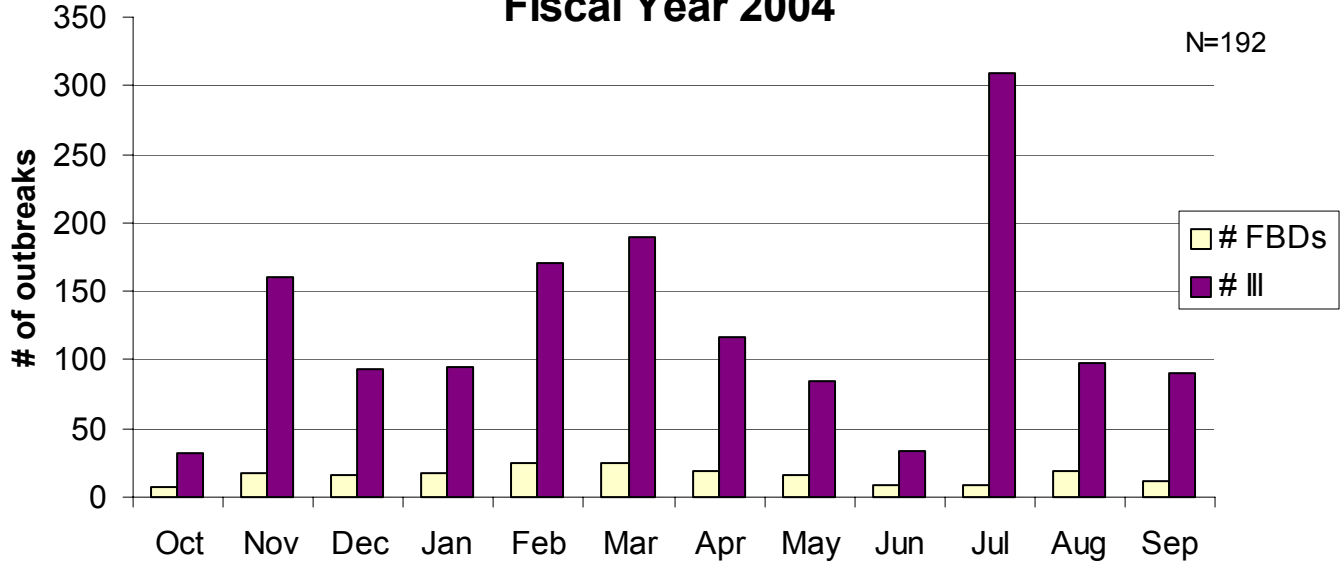
Note: The number of reported events cannot be interpreted as indicating the relative risk or safety of food in any jurisdiction.

*LHDs reporting 1 or 2 Foodborne Illness Outbreaks:

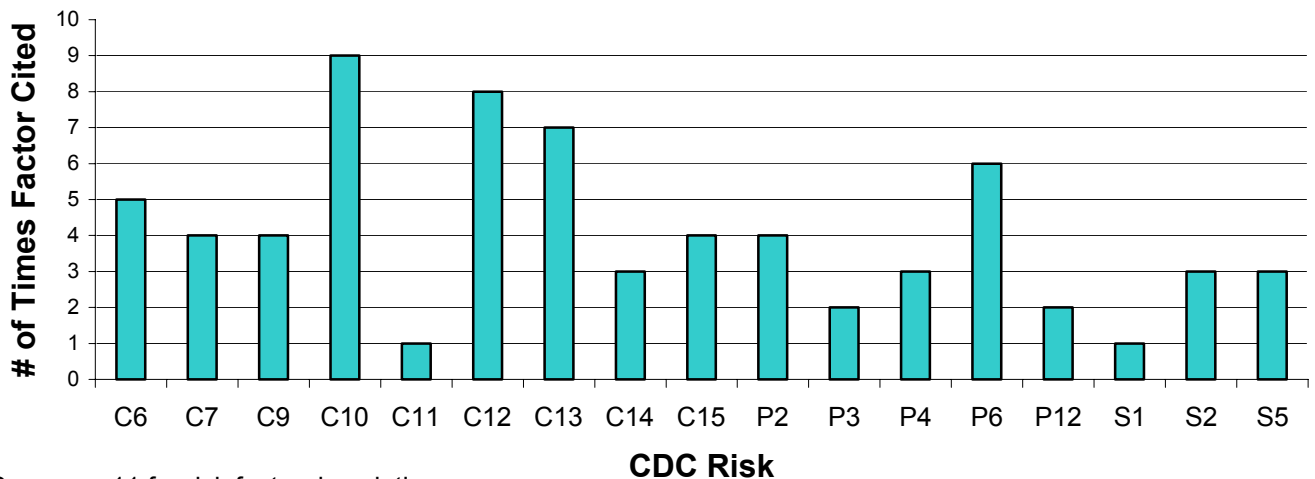
Two outbreaks: Bay, Calhoun, DHD #2, Midland, Monroe, Muskegon, Saginaw

One outbreak: Benzie-Leelanau, Berrien, Br-Hills-St. Joe, Central MI, Chippewa, Delta-Menominee, Ionia, LMAS, Sanilac, Tuscola, Van Buren/Cass, Holland

**Figure 4: Foodborne Illness Outbreaks, by Month-
Fiscal Year 2004**



**Figure 5: Factors Contributing to Fiscal Year 2004
Foodborne Illness Outbreaks, for Reports Citing a Primary
Factor**



See page 11 for risk factor descriptions

This questionnaire is authorized by law (Public Health Service Act, 42 USC §241). Although response to the questions asked is voluntary, cooperation of the patient is necessary for the study and control of disease. Public reporting burden for this collection of information is estimated to average 15 minutes per response. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to PHS Reports Clearance Officer, Rm 721-H, Humphrey Bg, 200 Independence Ave. SW, Washington, DC 20201; ATTN: PRA, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

The following codes are to be used to fill out Part 1 (question 9) and Part 2 (question 15).

Contamination Factors:¹

- C1 - Toxic substance part of tissue (e.g., ciguatera)
- C2 - Poisonous substance intentionally added (e.g., cyanide or phenolphthalein added to cause illness)
- C3 - Poisonous or physical substance accidentally/incidentally added (e.g., sanitizer or cleaning compound)
- C4 - Addition of excessive quantities of ingredients that are toxic under these situations (e.g., niacin poisoning in bread)
- C5 - Toxic container or pipelines (e.g., galvanized containers with acid food, copper pipe with carbonated beverages)
- C6 - Raw product/ingredient contaminated by pathogens from animal or environment (e.g., *Salmonella enteritidis* in egg, Norwalk in shellfish, *E. coli* in sprouts)
- C7 - Ingestion of contaminated raw products (e.g., raw shellfish, produce, eggs)
- C8 - Obtaining foods from polluted sources (e.g., shellfish)
- C9 - Cross-contamination from raw ingredient of animal origin (e.g., raw poultry on the cutting board)
- C10 - Bare-handed contact by handler/worker/preparer (e.g., with ready-to-eat food)
- C11 - Glove-handed contact by handler/worker/preparer (e.g., with ready-to-eat food)
- C12 - Handling by an infected person or carrier of pathogen (e.g., *Staphylococcus*, *Salmonella*, Norwalk agent)
- C13 - Inadequate cleaning of processing/preparation equipment/utensils – leads to contamination of vehicle (e.g., cutting boards)
- C14 - Storage in contaminated environment – leads to contamination of vehicle (e.g., store room, refrigerator)
- C15 - Other source of contamination (*please describe in Comments*)

Proliferation/Amplification Factors:¹

- P1 - Allowing foods to remain at room or warm outdoor temperature for several hours (e.g., during preparation or holding for service)
- P2 - Slow cooling (e.g., deep containers or large roasts)
- P3 - Inadequate cold-holding temperatures (e.g., refrigerator inadequate/not working, iced holding inadequate)
- P4 - Preparing foods a half day or more before serving (e.g., banquet preparation a day in advance)
- P5 - Prolonged cold storage for several weeks (e.g., permits slow growth of psychrophilic pathogens)
- P6 - Insufficient time and/or temperature during hot holding (e.g., malfunctioning equipment, too large a mass of food)
- P7 - Insufficient acidification (e.g., home canned foods)
- P8 - Insufficiently low water activity (e.g., smoked/salted fish)
- P9 - Inadequate thawing of frozen products (e.g., room thawing)
- P10 - Anaerobic packaging/Modified atmosphere (e.g., vacuum packed fish, salad in gas flushed bag)
- P11 - Inadequate fermentation (e.g., processed meat, cheese)
- P12 - Other situations that promote or allow microbial growth or toxic production (*please describe in Comments*)

Survival Factors:¹

- S1 - Insufficient time and/or temperature during initial cooking/heat processing (e.g., roasted meats/poultry, canned foods, pasteurization)
- S2 - Insufficient time and/or temperature during reheating (e.g., sauces, roasts)
- S3 - Inadequate acidification (e.g., mayonnaise, tomatoes canned)
- S4 - Insufficient thawing, followed by insufficient cooking (e.g., frozen turkey)
- S5 - Other process failures that permit the agent to survive (*please describe in Comments*)

Method of Preparation:²

- M1 - Foods eaten raw or lightly cooked (e.g., hard shell clams, sunny side up eggs)
- M2 - Solid masses of potentially hazardous foods (e.g., casseroles, lasagna, stuffing)
- M3 - Multiple foods (e.g., smorgasbord, buffet)
- M4 - Cook/serve foods (e.g., steak, fish fillet)
- M5 - Natural toxicant (e.g., poisonous mushrooms, paralytic shellfish poisoning)
- M6 - Roasted meat/poultry (e.g., roast beef, roast turkey)
- M7 - Salads prepared with one or more cooked ingredients (e.g., macaroni, potato, tuna)
- M8 - Liquid or semi-solid mixtures of potentially hazardous foods (e.g., gravy, chili, sauce)
- M9 - Chemical contamination (e.g., heavy metal, pesticide)
- M10 - Baked goods (e.g., pies, eclairs)
- M11 - Commercially processed foods (e.g., canned fruits and vegetables, ice cream)
- M12 - Sandwiches (e.g., hot dog, hamburger, Monte Cristo)
- M13 - Beverages (e.g., carbonated and non-carbonated, milk)
- M14 - Salads with raw ingredients (e.g., green salad, fruit salad)
- M15 - Other, does not fit into above categories (*please describe in Comments*)
- M16 - Unknown, vehicle was not identified

¹ Frank L. Bryan, John J. Guzewich, and Ewen C. D. Todd. Surveillance of Foodborne Disease III. Summary and Presentation of Data on Vehicles and Contributory Factors; Their Value and Limitations. *Journal of Food Protection*, 60; 6:701-714, 1997.

² Weingold, S. E., Guzewich JJ, and Fudala JK. Use of foodborne disease data for HACCP risk assessment. *Journal of Food Protection*, 57; 9:820-830, 1994.